REMARKS

No claims have been added or cancelled. Claim 24 was amended. Accordingly, claims 1—6, 8—9, 11 and 24—25 are pending.

The §103 Rejections

The Applicant submits that the Office has failed to establish a *prima facie* case of obviousness and, in view of the comments below, respectfully traverses the Office's rejections. However, before discussing the substance of the Office's rejections, a section entitled "The §103 Standard" is provided and will be used in addressing the Office's rejections. Following this section, a section entitled "The Leo Reference" is provided, which describes Leo's disclosure and teachings.

The §103 Standard

To establish a *prima facie* case of obviousness, three basic criteria *must* be met. MPEP § 2142. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992); *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988). Second, there must be a reasonable expectation of success. *In re Merck & Co., Inc.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974).

Hence, when patentability turns on the question of obviousness, the search for, and analysis of, the prior art includes evidence relevant to the finding of whether there is a teaching, motivation, or suggestion to select and combine or modify the references relied on as evidence of obviousness. The need for

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specificity pervades this authority. See, e.g., *In re Kotzab*, 217 F.3d 1365, 1371, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000) ("particular findings must be made as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected these components for combination in the manner claimed").

The Leo Reference

The Leo reference was cited as an example of partially pre-aggregating records according to a single grouping column, and then aggregating records derived from the partial pre-aggregation. The Applicant respectfully disputes this characterization of the Leo reference.

Leo discloses three embodiments, wherein each of FIGS. 2, 3 and 4 illustrate one of the three embodiments, respectively. As will be seen, none of these embodiments discloses "partially pre-aggregating records" according to "a single grouping column" and then "aggregating records derived from the partial pre-aggregation".

FIG. 2 shows two-stage single-distinct aggregation (starting at column 5, line 42). Note that the Applicant's claim 1 recites a single grouping column; therefore, of Leo's three disclosed embodiments, this is the only one that is relevant. Significantly, all of the aggregation is performed by the second stage row source. *Thus, Leo's version of FIG. 2 fails to show partially pre-aggregating and then aggregating, as recited in claim 1.* Instead, Leo discloses *performing the entire aggregation process in the second stage.* Accordingly, the only embodiment disclosed by Leo configured for operation according to 'single grouping' fails to show the 'pre-aggregation' and 'aggregation' recited by the Applicant's claims.

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FIG. 3 shows multiple-distinct aggregation (starting at column 7, line 60). Note that the embodiment of FIG. 3 discloses aggregation is based on multiple grouping columns. *Accordingly, this embodiment of the Leo reference fails to disclose elements recited by the Applicant's claim 1 because the Applicant recited "a single grouping column".*

Additionally, in Leo's FIG. 3 embodiment, aggregation is performed entirely in the second-stage row source (see FIG. 3). Accordingly, the first stage performs no aggregation (see column 8, lines 14—25). *Therefore, this embodiment of Leo also fails to disclose partial pre-aggregation, as recited by the Applicant, because all aggregation is performed in the second stage, by the second-stage row source.*

FIG. 4 shows three-stage multiple-distinct aggregation (starting at column 10, line 48). Leo's embodiment of FIG. 4 shows performance of partial aggregation in stage two, and completion of the aggregation in stage three. (See text in FIG. 4.) *However, this embodiment fails to disclose "a single grouping column", as recited in the Applicant's claim 1.* Instead, Leo's FIG. 4 version discloses aggregation based on multiple grouping columns (e.g. see the "multiple distinct aggregation" text of FIG. 4 and column 10, lines 50—52).

Thus, Leo discloses three embodiments, as seen in FIGS. 2—4. However, none of these embodiments discloses "partially pre-aggregating records" according to "a single grouping column" and then "aggregating records derived from the partial pre-aggregation".

Note that aspects of the embodiment of FIG. 2 (having 'single distinct aggregation') cannot be combined with aspects of the embodiment of FIG. 4 (having two-stage aggregation). This is because the second stage of the

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embodiment of FIG. 4 (wherein 'partial aggregation' is performed) exists specifically to perform 'multiple distinct aggregation' using a plurality of slave processors, wherein each of a plurality of slave processors is associated with one of a plurality of distinct key columns. Thus, stage two of Leo's FIG. 4 version (wherein partial aggregation is performed) is very closely intertwined with the multiple distinct columns, since multiple processors are associated with multiple distinct columns. Therefore, stage two of Leo's FIG. 4 version strongly teaches away from 'single distinct,' since that would destroy the economy that Leo derives from applying multiple slave processors to the multiply-distinct key columns. That is, Leo's FIG. 4 version is specifically tailored to take advantage of the association between multiple distinct key columns and multiple slave processes. To do otherwise would undermine the intent of the Leo design.

Thus, Leo fails to conceive or disclose "partially pre-aggregating records" according to "a single grouping column" and then "aggregating records derived from the partial pre-aggregation".

Traversal of the §103 Rejections. Leo in view of Agrawal

Claims 1, 11 and 24 stand rejected under 35 U.S.C. §103(a) as being obvious over Pat. No. 6,430,550, hereinafter "Leo," in view of U.S. Pat. No. 5,832,475 hereinafter "Agrawal." In response, the Applicant respectfully traverses the rejection.

Claim 1 recites a method for processing a database query comprising:
- partially pre-aggregating records in a database according to a single grouping column to provide a result that contains at least two records having like grouping column values;

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- aggregating records derived from the partial pre-aggregation to provide a result that contains records having unique grouping column values; and
- estimating the costs and benefits of the partial pre-aggregation, and partially pre-aggregating the records only if the estimating indicates that the benefits are greater than the costs.

The Applicant has thoroughly analyzed the Leo reference in the above section entitled "The Leo Reference." In the analysis, the Applicant noted that Leo discloses three embodiments, seen in FIGS. 2, 3 and 4 of Leo. None of these embodiments discloses "partially pre-aggregating records" according to "a single grouping column" and then "aggregating records derived from the partial pre-aggregation". Accordingly, the Leo fails to disclose the elements recited by claim 1.

The Patent Office suggests that "partially pre-aggregating" is shown by Leo at column 5, lines 7—20 and that "aggregating" is shown by Leo at column 6, lines 55—67.

The Applicant respectfully notes that the Patent Office's cited passage, column 5, lines 7—20, refers to "multiple-distinct aggregation" (see column 5, lines 7—8), and not "a single grouping column", as recited by the Applicant's claims. Thus, the Applicant's claim recited, "partially pre-aggregating records in a database according to a *single grouping* column to provide a result that contains at least two records having like grouping column values", (emphasis added) but the Patent Office cited a *multiple-distinct* embodiment. Therefore, the cited passage does not disclose the claim elements recited, and the Leo reference is deficient in this regard.

As "The Leo Reference" section has shown, Leo does disclose "single distinct" aggregation. However, Leo has failed to implement a "single grouping

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column" with "partial pre-aggregation". In particular, note that only the implementation of FIG. 2 discloses 'single distinct,' and this implementation fails to disclose a manner by which 'single distinct' can be integrated with partially pre-aggregating records. In fact, in the implementation of FIG. 2, aggregation is performed entirely in the second stage.

The Applicant respectfully notes that the Patent Office's cited passage, column 6, lines 55—67, refers to 'aggregation,' and not "aggregating records derived from the partial pre-aggregation" as recited in claim 1. That is, the Patent Office's cited passage refers to the second stage of the single column version (i.e. the FIG. 2 version). The cited passage relates to the full aggregation process (see right side of FIG. 2), and not aggregation of partially aggregated or pre-aggregated records. This is the case because the first stage of the FIG. 2 version does not perform any aggregation process. Therefore, the cited passage does not disclose the elements recited by the claim, and the Leo reference is deficient in this regard.

In particular, Leo has failed to disclose *any embodiment* configured to "partially pre-aggregating records" according to "a single grouping column" and then "aggregating records derived from the partial pre-aggregation". Accordingly, the Leo reference fails to disclose the elements recited by claim 1. Moreover, Agrawal fails to remedy the failings of Leo. Accordingly, claim 1 is allowable over Leo in view of Agrawal.

Claim 11 depends from claim 1, and is allowable by virtue of this dependence.

Claim 24, as amended, is allowable for at least the same reasons that claims 1 and 11 are allowable.

Traversal of the §103 Rejections Leo in view of Sharma

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Claims 2—6, 8, 9 and 25 stand rejected under 35 U.S.C. §103(a) as being obvious over Leo in view of U.S. Pat. No. 5,511,190 hereinafter "Sharma." In response, the Applicant respectfully traverses the rejection.

Claims 2—6, 8, 9 and 25 depend from claims 1 or 24, and are allowable by virtue of this dependence, as well as for reasons associated with the elements recited individually by each claim.
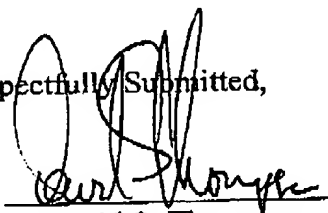
In particular, Sharma is not cited for, and does not, remedy the failings of Leo, as seen above. Accordingly, the references of record have failed to disclose the elements recited in the base claims, and the dependent claims are allowable by virtue of this dependence, as well as for reasons associated with the elements recited individually by each claim.

Conclusion

Claims 1—6, 8—9, 11 and 24—25 are in condition for allowance due to the amendment of independent claims 1 and 24 to include allowable subject matter from claims 7 and 26, respectively. Accordingly, the Applicant respectfully requests prompt issuance of the subject application. If any issues remain that prevent issuance of this application, the Examiner is urged to contact the undersigned attorney before issuing a subsequent Action.

Respectfully Submitted,

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